features with high aspect ratios typical allow only minimal or no electrolyte flow therein, the ionic transport relies solely on diffusion to deposit metal into these small features. A high copper concentration preferably about 0.8M or greater, in the electrolyte enhances the diffusion process and eliminates the mass transport limitations because the diffusion flux is proportional in magnitude to the bulk electrolyte concentration. A preferred metal concentration is between about 0.8 and about 1.2 M. Generally, the higher the metal concentration the better; however, one must be careful not to approach the solubility limit where the metal salt will precipitate.

Please replace the paragraph at column 18, line 26 with the following paragraph:

The invention also contemplates the addition of acids other than sulfuric acid into the electrolyte to provide for better complexation and/or solubility for the copper ions and the copper metal which results in improved deposition properties. These compounds include anthranilic acid, acetic acid, citric acid, lactic acid, sulfamic acid, ascorbic acid, glycolic acid, oxalic acid, benzenedisulfonic acid, tartaric acid and/or malic acid.

**In the Claims:**

Please add new claims 30-90 as follows:

30. An apparatus for electrochemically depositing a metal onto a semiconductor substrate, comprising:

a container having a fluid inlet, a fluid outlet, and an open portion, the container being configured to contain an electrochemical plating solution therein;

a substrate holder assembly configured to electrically contact a substrate plating surface and support the plating surface in fluid communication with the electrochemical plating solution via the open portion;

an anode in fluid communication with the electrochemical plating solution; and

a porous fluid flow adjustment member positioned across the container between the anode and the open portion.

31. The apparatus of claim 30, wherein the porous fluid flow adjustment member comprises a ceramic member.

32. The apparatus of claim 30, comprising a power supply in electrical communication with the anode and the substrate holder assembly.

33. The apparatus of claim 32, wherein a cathode of the power supply is in electrical communication with the substrate holder and an anode of the power supply is in electrical communication with the anode.

34. The apparatus of claim 30, wherein the anode is positioned in a lower portion of the container.

35. The apparatus of claim 34, wherein the anode comprises:
an enclosure having an open portion;
a soluble metal material positioned at least partially in the enclosure; and
a fluid permeable membrane positioned over the open portion.

36. The plating cell of claim 35, wherein the enclosure comprises a porous ceramic.

37. The plating cell of claim 35, wherein the anode comprises an ion source material positioned in a polymeric membrane.

38. The apparatus of claim 30, wherein the substrate holder assembly comprises a cathode contact member and a backside substrate engaging member configured to urge the substrate plating surface against the cathode contact member.

39. The apparatus of claim 38, wherein the cathode contact member comprises:
an annular member; and
at least one substrate contact element positioned on the annular member.

40. The apparatus of claim 39, comprising an insulative coating positioned on an outer surface of the annular member.

41. The apparatus of claim 39, wherein the at least one substrate contact element comprises a continuous ring configured to electrically contact a perimeter of the plating surface.

42. The apparatus of claim 39, wherein the at least one substrate contact element comprises a plurality of substrate contact pins radially positioned on the annular member to electrically contact a perimeter of the plating surface.

43. The apparatus of claim 39, comprising at least one bubble release port positioned adjacent an edge of the annular member.

44. The apparatus of claim 42, comprising an annular seal member positioned on the annular member radially inward of the plurality of substrate contact pins, the annular seal member being configured to sealable engage the plating surface to prevent the electrochemical plating solution from passing therebetween.

45. The apparatus of claim 41, comprising an O-ring seal member positioned radially inward of the continuous ring.

46. The apparatus of claim 38, wherein the backside substrate engaging member comprises an elastomer seal positioned to sealably engage a backside perimeter of the substrate.

47. The apparatus of claim 38, wherein the backside substrate engaging member comprises an inflatable bladder assembly positioned to engage a backside perimeter of the substrate.

48. The apparatus of claim 30, comprising an egress gap of between about 1mm

and about 30mm between an outer surface of the substrate holder assembly and an inner surface of the container.

49. The apparatus of claim 48, wherein the egress gap is between about 2mm and about 6mm.

50. The apparatus of claim 30, comprising at least one auxiliary electrode positioned in fluid communication with the electrochemical plating solution.

51. The apparatus of claim 50, wherein the at least one auxiliary electrode comprises at least one electrode member positioned below the substrate plating surface, the at least one auxiliary electrode being in electrical communication with a source of electrical power.

52. The apparatus of claim 30, further comprising a membrane positioned across the container above the anode and below the substrate holder assembly.

53. An electrochemical plating cell, comprising:

a fluid basin having a fluid inlet and a fluid outlet;

an anode positioned in the fluid basin;

a substrate contact member configured to electrically contact and position a substrate plating surface in the fluid outlet, the substrate contact member comprising a plurality of radially positioned conductive substrate contact pins positioned to electrically contact a perimeter of the substrate plating surface; and

a backside substrate engaging member having an annular seal positioned to sealably engage a perimeter of a backside of the substrate and urge the plating surface against the contact pins.

54. The plating cell of claim 53, comprising a power supply in electrical communication with the anode and the substrate contact pins.

55. The plating cell of claim 54, comprising a variable resistor positioned in series between the power supply and each of the substrate contact pins, the variable resistor being configured to control an electrical current supplied to the respective substrate contact pins.

56. The plating cell of claim 53, wherein the anode comprises:
an enclosure having an open portion;
a soluble metal material positioned at least partially in the enclosure; and
a membrane positioned over the open portion.

57. The plating cell of claim 56, wherein the enclosure comprises a porous ceramic.

58. The plating cell of claim 53, wherein the anode comprises an ion source material positioned in a polymeric membrane.

59. The plating cell of claim 53, comprising a flow adjustment member positioned between the anode and the fluid outlet.

60. The plating cell of claim 53, comprising a membrane positioned between the anode and the substrate contact member.

61. The plating cell of claim 53, comprising at least one auxiliary electrode positioned in the fluid basin below the overflow weir.

62. A fluid processing cell for semiconductor processing, comprising:
a fluid container having an open top;
an anode electrode positioned in the fluid container; and
a cathode substrate support, comprising:
an annular ring;
a plurality of substrate contact pins positioned on the annular ring; and
an electrically insulating layer positioned over the annular ring.

63. The fluid processing cell of claim 62, further comprising a power supply in communication with the cathode substrate support and the anode electrode.

64. The fluid processing cell of claim 62, further comprising a plurality of auxiliary electrodes positioned in the fluid container below the cathode substrate support and above the anode.

65. The fluid processing cell of claim 62, further comprising a fluid flow adjustment member positioned across the fluid container above the anode.

66. The fluid processing cell of claim 62, further comprising an annular seal positioned on the substrate support radially inward of the plurality of substrate contact pins.

67. An electrochemical plating cell, comprising:

a fluid basin;

an anode positioned in the fluid basin;

a ring shaped cathode substrate support member having a plurality of annularly positioned substrate contact pins; and

an annular seal positioned radially inward of the plurality of annularly positioned substrate contact pins.

68. The electrochemical plating cell of claim 67, further comprising a plurality of auxiliary electrodes positioned in the fluid basin below the substrate support member and above the anode.

69. The electrochemical plating cell of claim 67, further comprising a membrane positioned across the fluid basin above the anode.

70. The electrochemical plating cell of claim 67, further comprising a fluid flow

adjustment member positioned across the fluid basin above the anode.

71. An electrochemical plating cell, comprising:

a cathode substrate contact member positioned above a fluid basin, the cathode substrate contact member comprising:

an annular support member;

a plurality of electrically conductive substrate contact pins positioned on the annular support member; and

an electrically insulating layer covering the annular support member;

an anode electrode positioned in the fluid basin;

at least one auxiliary electrode positioned in the fluid basin below the cathode substrate contact member; and

a fluid flow adjustment member positioned across the fluid basin above the anode electrode.

72. The electrochemical plating cell of claim 71, further comprising a membrane positioned across the fluid basin above the anode member.

73. An electrochemical plating cell, comprising:

a fluid basin having a fluid outlet configured to receive a substrate;

a substrate support assembly configured to support and electrically contact the substrate;

an anode assembly; and

a membrane positioned across the fluid basin between the anode assembly and the fluid outlet.

74. The electrochemical plating cell of claim 73, wherein the anode assembly further comprises a porous enclosure having a fluid permeable membrane positioned across an open portion thereof and an ion source material positioned in the porous enclosure.

75. The electrochemical plating cell of claim 73, wherein the anode assembly

comprises a fluid permeable membrane positioned to surround the ion source material.

76. The electrochemical plating cell of claim 73, further comprising at least one auxiliary electrode positioned in the fluid basin above the anode assembly.

77. The electrochemical plating cell of claim 73, wherein the substrate support assembly comprises:

a cathode contact ring having a plurality of radially positioned substrate contact pins positioned thereon; and

a backside substrate engaging member configured to sealably engage a perimeter of a backside of the substrate.

78. A method for electrochemically plating a metal onto a plating surface of a semiconductor substrate, comprising:

positioning the plating surface in electrical communication with a cathode electrode;

immersing the plating surface into an electrochemical plating solution that is in electrical communication with an anode;

applying a first current density across the plating surface via the cathode electrode and the anode for a first duration; and

applying a second current density across the plating surface via the cathode electrode and the anode for a second duration, wherein the first current density is less than the second current density.

79. The method of claim 78, wherein the first current density is about 5 $mA/cm^2$.

80. The method of claim 79, wherein the second current density is between about 5 $mA/cm^2$ and about 40 $mA/cm^2$.

81. The method of claim 78, further comprising applying a dissolution reverse current of between about 5 $mA/cm^2$ and about 80 $mA/cm^2$ for between about 0.1 seconds and

about 100 seconds.

82. The method of claim 78, wherein immersing the plating surface further comprises applying an immersion bias to the substrate during the process of immersing the plating surface into the electrochemical plating solution.

83. The method of claim 82, wherein the immersion bias comprises a forward plating bias.

84. The method of claim 83, wherein the forward plating bias is configured to overcome acid etching of the plating surface during the immersion process.

85. A method for electrochemically plating a metal onto a substrate, comprising:

positioning the substrate in electrical communication with a cathode electrode;

applying an immersion bias to the substrate; and

immersing the substrate into an electrochemical plating solution while applying the immersion bias, wherein the immersion bias is configured to overcome etching of a layer on the substrate during the immersion process.

86. The method of claim 85, further comprising:

applying a first current density across a plating surface of the substrate via the cathode electrode and an anode positioned in electrical communication with the electrochemical plating solution for a first duration; and

applying a second current density across the plating surface via the cathode electrode and the anode for a second duration, wherein the first current density is less than the second current density.

87. The method of claim 85, wherein the first current density is about 5 $mA/cm^2$.

88. The method of claim 87, wherein the second current density is between about 5 $mA/cm^2$ and about 40 $mA/cm^2$.